

TECHNICAL SPECIFICATION

HT & LT STAY SETS

1.0 SCOPE

This specification covers design, manufacture, testing and dispatch of GI Stay Sets of 16 mm and 20 mm dia.

2.0 GENERAL REQUIREMENTS

2.1 16 MM Dia Stay sets (Galvanized) – LT Stay Set

This stay sets (Line Guy set) will consist of the following components:-

2.1.1. Anchor Rod with one washer and Nut

Overall length of rod should be 1800 mm to be made out of 16 mm dia GS Rod, one end threaded up to 40 mm length with a pitch of 5 threads per cm and provided with one square GS washer of size 40X40x1.6mm and one GS hexagonal nut conforming to IS:1367:1967 & IS:1363:1967. Both washer and nut to suit threaded rod of 16 mm dia. The other end of the rod to be made into a round eye having an inner dia of 40mm with best quality welding.

2.1.2. Anchor Plate Size 200 x 200 x6 mm

To be made out of GS plate of 6 mm thickness. The anchor plate should have at its centre 18 mm dia hole.

2.1.3 Turn Buckle & Eye Bolt with 2 Nuts

To be made of 16 mm dia GS Rod having an overall length of 450mm, one end of the rod to be threaded up to 300 mm length with a pitch of 5 threads per cm and provided with two GS Hexagonal nuts of suitable size conforming to IS:1363:1967 & IS:1367:1967. The other end of rod shall be rounded into a circular eye of 40mm inner dia with proper and good quality welding.

2.1.4. Bow with Welded Angle

To be made out of 16mm dia GS rod. The finished bow shall have an overall length of 995 mm and height of 450 mm, the apex or top of the bow shall be bent at an angle of 10 R. The other end shall be welded with proper and good quality welding to a GS angle 180 mm long having a dimension of 50x50x6mm. The angle shall have 3 holes of 18 mm dia each.

2.1.5 Thimble

To be made on 1.5 mm thick GS sheet into a size of 75x22x40mm and shape as per standard shall be supplied.

Average Weight of Finished 16mm Stay Sets shall be at least 7.702 KG (Minimum) (Excluding Nuts Thimbles and Washer) 8.445 Kg. (Maximum)

2.2 20 mm Dia Stays Sets for 11 KV,33 KV Lines (Galvanized) HT Stay Set

The Stay Set (Line Guy Set) will consist of the following components:

2.2.1 Anchor Rod with one Washer and Nut

Overall length of Rod should be 1800mm to be made out of 20 mm dia GS Rod, one end threaded up to 40 mm length with a pitch of threads per cm. And provided with one square G.S. Washer of Size 50x50x1.6mm and one GS Hexagonal nut conforming to IS: 1363:1967 & IS:1367:1967. Both washer and nut to suit the threaded rod of 20mm. The other end of the rod to be made into a round eye having an inner dia of 40mm with best quality welding. Dimensional and other details are indicated and submitted by bidders for owner's approval before start of manufacturing.

2.2.2 Anchor Plate Size 300 x 300 x 8 mm

To be made out of G.S. Plate of 8 mm thickness. The anchor plate 3+ to have at its centre 22mm dia hole.

2.2.3 Turn Buckle, Eye Bolt with 2 Nuts.

To be made of 20 mm dia G.S. Rod having an overall length of 450 mm. One end of the rod to be threaded up to 300 mm length with a pitch of 4 threads per cm. The 20 mm dia bolt so made shall be provided with two G.S. Hexagonal nuts of suitable size conforming to IS: 1363:1967 & IS: 1367:1967.

The other end of the rod shall be rounded into a circular eye of 40mm inner dia with proper and good quality of welding. Welding details are to be indicated by the bidder separately for approval.

2.2.4 Bow with Welded Channel:

To be made out of 16mm dia G.S.Rod. The finished bow shall have an overall length of 995 mm and height of 450 mm. The apex or top of the bow shall be bent at an angle of 10R. The other end shall be welded with proper and good quality welding to a G.S. Channel 200 mm long having a dimension of 100x50x4.7 mm.

The Channel shall have 2 holes of 18 mm dia and 22 dia hole at its centre as per drawing No.3 enclosed herewith.

2.2.5 Thimble 2 Nos.

To be made of 1.5 mm thick G.S sheet into a size of 75x22x40mm and shape as per standard.

2.2.6 Galvanizing

The complete assembly shall be hot dip galvanized as per ISS.

2.2.7. Welding

The minimum strength of welding provided on various components of 16mm and 20 mm dia stay sets shall be 3100 kg & 4900 kg respectively. Minimum 6mm fillet weld or its equivalent weld area should be deposited in all positions of the job i.e. at any point of the weld length. The welding shall be conforming to relevant IS:823/1964 or its latest amendment.

2.2.8. Threading

The threads on the Anchor Rods, Eye Bolts and Nuts shall be as per specification IS; 4218:1967 (ISO Metric Screw Threads). The Nuts shall be conforming to the requirements of IS: 1367:1967 and have dimension as per IS 1363:1967. The mechanical property requirement of fasteners shall conform to the properly clause 4.6 each for anchor rods and Eye bolt and property clause 4 for nuts as per IS: 1367:1967.

Average weight of finished 20 mm Stays Set: 14.523 Kg.(Min) (Excluding Nuts Thimble & Washer) :15.569 Kg. (Max.)

3.0 TESTS

The contractor shall be required to conduct testing of materials at Govt./Recognized testing laboratory during pre-dispatch inspection for Tensile Load of 3100 Kg/4900Kg. applied for one minute on the welding and maintained for one minute for 16 mm and 20mm dia stay sets respectively.

4.0 IDENTIFICATION MARK

All stay sets should carry the identification mark of the Purchaser (NESCO/WESCO/SOUTHCO) as applicable. This should be engraved on the body of stay rods to ensure proper identification of the materials.

The nuts should be of a size compatible with threaded portion of rods and there should be not play or slippage of nuts.

Welding wherever required should be perfect and should not give way after erection.

5.0 TOLERANCES

The tolerances for various components of the stay sets are indicated below subject to the condition that the average weight of finished stay sets of 16mm dia excluding nuts, thimbles and washers shall not be less than the weight specified above:-

HT / LT STAY SETS

GURANTEED TECHNICAL PARTICULARS

Sl No.	Item Description	Specified Parameters				
		Section Tolerances	Fabrication Tolerances	Material	Type of stay sets	Bidder's offer
1.	Anchor Plate	6mm thick +2.5%-5% 8mm thick+2.5% -5%	200x200mm +1% 300x300mm +1%	GS Plate 6 mm thick GS Plate 8 mm thick	LT Stay Set HT Stay Set	
2.	Anchor Rod	16mmdia +5%- 3% 20mm dia +3%-2%	Length 1800mm+0.5% Rounded Eye 40 mm inside dia + 3% Threading 40mm +11%-5% Length 1800mm +0.5% Round Eye 40mm inside dia + 3%. Threading 40mm +11%-5%	GS Round 16mm dia GS Round 16mm dia GS Round 20mm dai GS Round 20mm dia	LT Stay Set HT Stay Set	
3.	Turn Buckle Bow	16mm dia +5%-3%	Length 995mm +1% 16mm dia Length180	GS Round 16mm dia. GS Angle	LT Stay Set HT Stay Set	

			mm +1% 50x50x6mm Channel length 200mm + 1%	G S Channel 100x50x4.7 mm		
4.	Eye Bolt Rod	16mm dia +5%-3% 20mm dia + 3% -2%	Length 450mm + 1% Threading 300mm +1% Round Eye 40mm inside dia+3% Length450 mm +1% Threading 300mm +1% Round Eye 40 mm inside dia +3%	GS Round 16 mm dia GS Round 20mm dia.	LT Stay Set HT Stay Set	
5	Galvanis ation thickness				LT Stay Set HT Stay Set	
a	Anchor Plate				LT Stay Set HT Stay Set	
b	Anchor Rod				LT Stay Set HT Stay Set	
c	Turn Buckle Bow				LT Stay Set HT Stay Set	
d	Eye Bolt Rod				LT Stay Set HT Stay Set	
6	Weight				LT Stay Set	

	of complete set				HT Stay Set	
7	Whether drawing submitted					

TECHNICAL SPECIFICATIONS

STAY WIRE (7/8, 7/10 & 7/12 SWG)

1.0 Application Standards

Except when they conflict with the specific requirements of this specification, the G.I Stay Stranded Wires shall comply with the specific requirements of IS: 2141-1979. IS: 4826-1979 & IS: 6594-1974 or the latest versions thereof.

2.0 Application and Sizes

- a) The G.I. stranded wires covered in this Specification are intended for use on the overhead power line poles, distribution transformer structures etc.
- b) The G.I stranded wires shall be of 7/8 SWG (7mm for 33 KV lines, 7/10SWG (7/3.15 mm for 11KV lines and 7/12 SWG 7/2.5 mm for LT lines standard sizes.

3.0 Materials

The wires shall be drawn from steel made by the open hearth basic oxygen or electric furnace process and of such quality that when drawn to the size of wire specified and coated with zinc, the finished strand and the individual wires shall be of uniform quality and have the properties and characteristics as specified in this specification. The wires shall not contain sulphur and phosphorus exceeding **0.060%** each.

3.1 Tensile Grade

The wires shall be of tensile grade 4, having minimum tensile strength of 700 N/mm² conforming to IS:2141.

3.2 General Requirements

- a) The outer wire of strands shall have a right-hand lay.
- b) The lay length of wire strands shall be 12 to 19 times the strand diameter.

3.3 Minimum Breaking Load & Galvanising

The minimum breaking load of the wires before and after stranding shall be as follows:

No. of Wires & Const.	Wire Dia (mm)	Min. breaking load of the Single wire before stranding (KN)	Min. breaking load of the standard wire (KN)
7 (6/1)	2.5	3.44	21.40
7 (6/1)	3.15	5.46	34.00
7 (6/1)	4.0	8.80	54.9
Minimum weight of zinc coating before stranding	490 gm/mm ²	490 gm/mm ²	490 gm/mm ²
Minimum weight of zinc coating before stranding	475 gm/mm ²	475 gm/mm ²	475 gm/mm ²

4.0 Construction

- a) The galvanized stay wire shall be of 7-wire construction. The wires shall be so stranded together that when an evenly distributed pull is applied at the ends of completed strand, each wire shall take an equal share of the pull.
- b) Joints are permitted in the individual wires during stranding but such joints shall not be less than 15 metres apart in the finished strands.
- c) The wire shall be circular and free from scale, irregularities, imperfection, flaws, splits and other defects.

5.0 Tolerances

A tolerance of (\pm) 2.5% on the diameter of wires before stranding shall be permitted.

6.0 Sampling Criteria

The sampling criteria shall be in accordance with IS :2141.

7.0 Tests on Wires before Manufacture

7.1 The wires shall be subjected to the following tests in accordance with IS :2141.

- a) Ductility Test
- b) Tolerance on Wire Diameter

7.2 Tests on Completed Strand

The completed strand shall be tested for the following tests in accordance with IS:2141.

- a) Tensile and Elongation Test: The percentage elongation of the stranded wire shall not be less than 6%.
- b) Chemical analysis
- c) Galvanizing Test

The Zinc Coating shall conform to "Heavy Coating" as laid down in IS:4826

8.0 Marking

Each coil shall carry a metallic tag, securely attached to the inner part of the coil bearing the following information:

- a) Manufacturers name or trade mark
- b) Lot number and coil number
- c) Size
- d) Construction
- e) Tensile Designation
- f) Lay
- g) Coating
- h) Length
- i) Mass
- j) ISI certification mark, if any

9.0 Packing

The wires shall be supplied in 75-100 Kg. coils. The packing should be done in

accordance with the provisions of IS:6594

10.0 Other Items:

For remaining items of stay sets mentioned in the enclosed drawing, relevant applicable Indian standards shall be applicable.

GURANTEED TECHNICAL PARTICULARS

STAY WIRE (7/8, 7/10 & 7/12 SWG)

Sl. No.	GENERAL TECHNICAL PARTICULARS	7/8 SWG	7/10 SWG	7/12 SWG
1	Nominal diameter of wire			
2	Tolerance in diameter			
3	Sectional Area (In Sq. mm.)			
4	Tensile strength			
a	Min. N/mm ²			
b	Max. N/mm ²			
5	Minimum breaking load (KN)			
6	Type of coating Heavy/Medium/Light			
7	Variety Hard/Soft			
8	Weight of Zinc coating (Gms/Sq. Mtr.) Min.			
9	No. of dips the coating is able to withstand as 18 ± 20°C			
10	Adhesion Test (Wrap Test at 1 turn per second coiling while stress not exceeding % nominal tensile strength)			
a	Min. complete turn of wrap			
b	Dia of mandrel on which wrapped			
11	Bend Test			
a	Angle			
b	Dia round a format to be bent			
12	Freedom from defect			
13	Chemical composition the MS Wire used shall not exceed			
a	Sulphur 0.060%			
b	Phosphorous 0.065%			

TECHNICAL SPECIFICATIONS

GI WIRE 6 SWG & GI WIRE 8 SWG

01. SCOPE

This specification covers manufacture, testing and supply of hot dip galvanized MS solid wire of sizes 6 SWG (5 MM) & 8 SWG (4 MM) diameters.

02. APPLICABLE STANDARDS

02.1 ZINC

Zinc shall conform to grade Zen 98 specified in IS 209& IS: 4826-1979 with upto date amendments.

02.2 ZINC COATING

Zinc coating shall be in accordance with IS: 4826-1979 for heavily coated hard quality.

02.3 GALVANISING

Galvanizing shall be as per IS:2629-1966, IS 4826-1979 with up to date amendments

02.4 UNIFORMITY OF ZINC COATING

Uniformity of zinc coating shall be as per IS:2633-1972 with up to date amendments

02.5 TENSILE PROPERTIES

The tensile strength of the wire after galvanizing shall be between 55-95 Kg/sq.mm ensuring MS wire mechanical properties as per IS-28:1972 8.1 to 8.3.

02.6 FREEDOM FROM DEFECTS

As per IS:2629-1966 & 4826-1979 & with up to date amendments be ensured

03. MATERIAL

The mild steel wire shall have chemical composition maximum sulphur- 0.055%, phosphorous -0.055%, Carbon 0.25%.

04. TESTS

During the process of manufacturer/fabrication and all tests for chemical, mechanical, galvanizing as per IS-280-1979, IS1521-1972, IS-1755-1961, IS:6745-1972 & 4826-1979 shall be carried out. The certificate towards, chemical composition shall be submitted for each lot offered for inspection.

The following tests shall be conducted in presence of the representative of the purchaser:

1. Visual physical inspection and measurement of specified dimension
2. Coating test as per IS:1755-1961, IS 2629-1966, IS:2633-1972, IS:4826-1969
3. Adhesion test as per IS:1755-1961,IS:2629-1966,IS:2633-1972,IS:4826-1969,&IS:6745-1972
4. Tensile strength and breaking load and elongation determined as per IS:1521-1972 with up to date amendments

05. PACKING & MARKING

Packing shall be as per IS:280-1979 and each coil shall be between 50-100 kg .marking shall be as per IS:280-1972

GURANTEED TECHNICAL PARTICULARS

GI WIRE 6 SWG & GI WIRE 8 SWG

Sl. No.	GENERAL TECHNICAL PARTICULARS	6 SWG	8 SWG
1	Nominal diameter of wire		
2	Tolerance in diameter		
3	Sectional Area (In Sq. mm.)		
4	Tensile strength		
a	Min. N/mm ²		
b	Max. N/mm ²		
5	Minimum breaking load (KN)		
6	Type of coating Heavy/Medium/Light		
7	Variety Hard/Soft		
8	Weight of Zinc coating (Gms/Sq. Mtr.) Min.		
9	No. of dips the coating is able to withstand as 18 ± 20°C		
10	Adhesion Test (Wrap Test at 1 turn per second coiling while stress not exceeding % nominal tensile strength)		
a	Min. complete turn of wrap		
b	Dia of mandrel on which wrapped		
11	Bend Test		
a	Angle		
b	Dia round a format to be bent		
12	Freedom from defect		
13	Chemical composition the MS Wire used shall not exceed		
a	Sulphur 0.060%		
b	Phosphorous 0.065%		

